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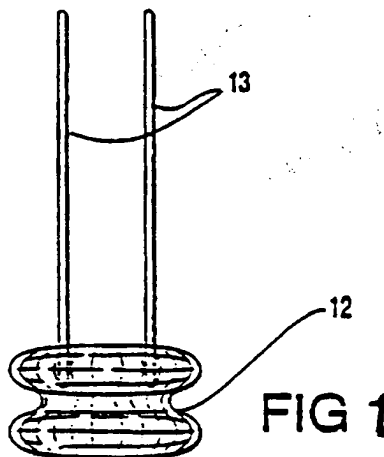
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(54) Tubular bandages

(57) A tubular bandage 12 comprises a length of tubular knitted fabric comprising one or more courses of substantially inelastic yarn interknitted with one or more courses of elastic yarn throughout said length, the bandage having a first end portion rolled outwardly from the free end and the other end portion rolled inwardly from the opposite free end to form two rolls, wherein a supporting structure is attached to said first end portion of said bandage. The supporting structure may be a wafer of plastics material or a U-shaped member.



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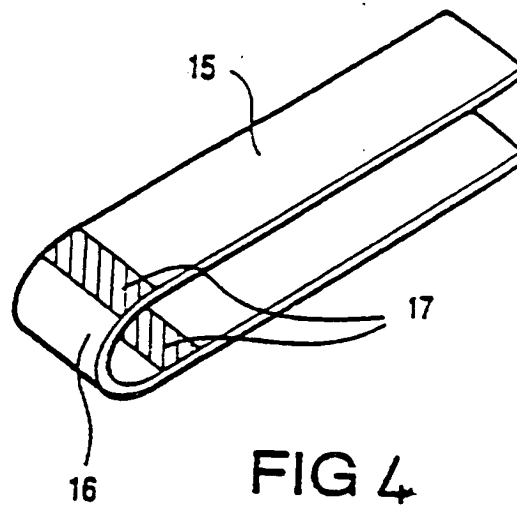
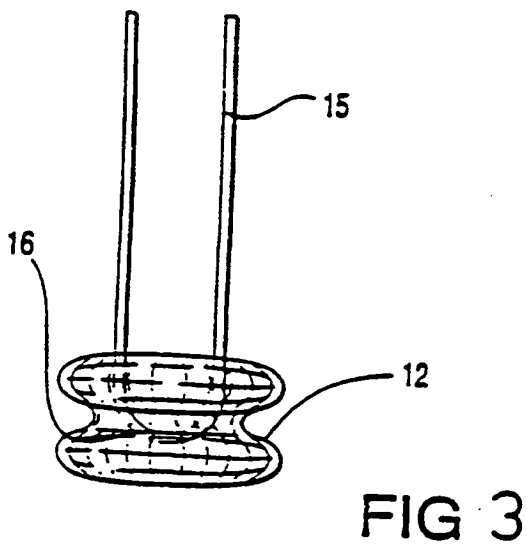
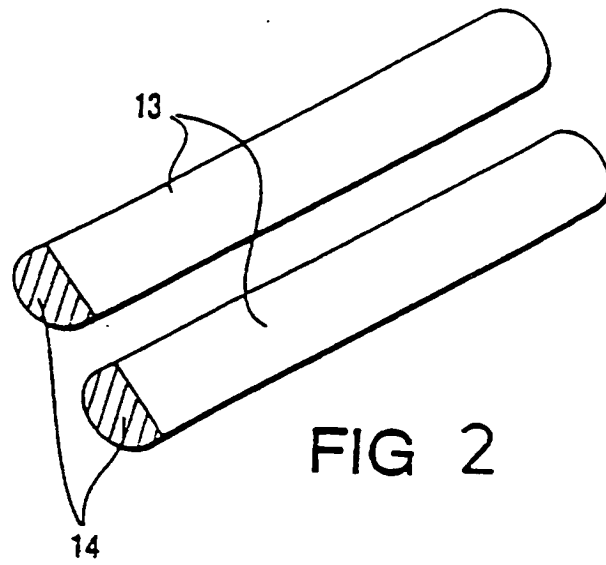
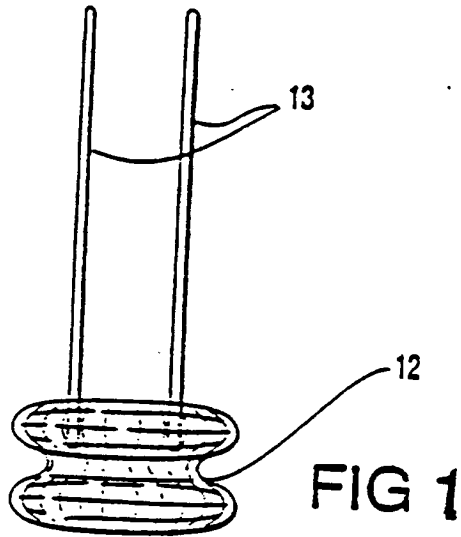


FIG 6

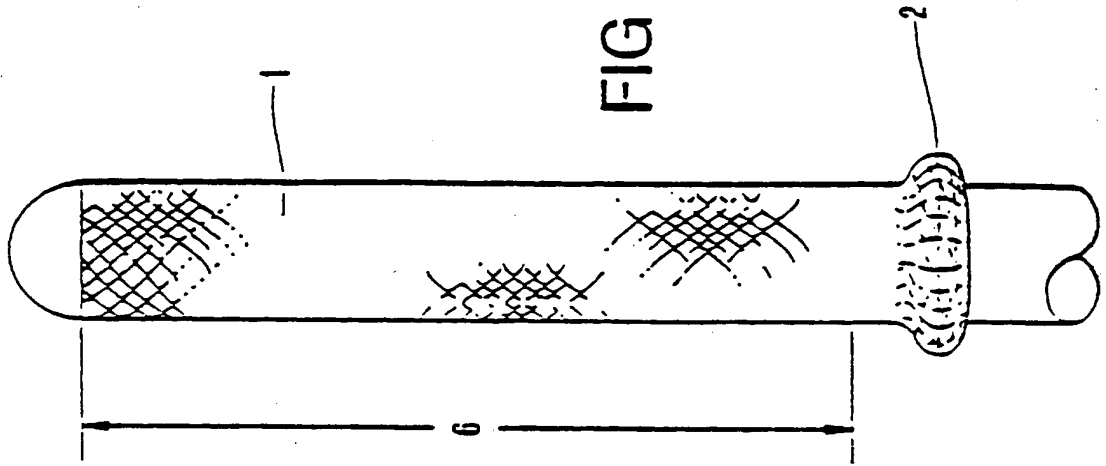
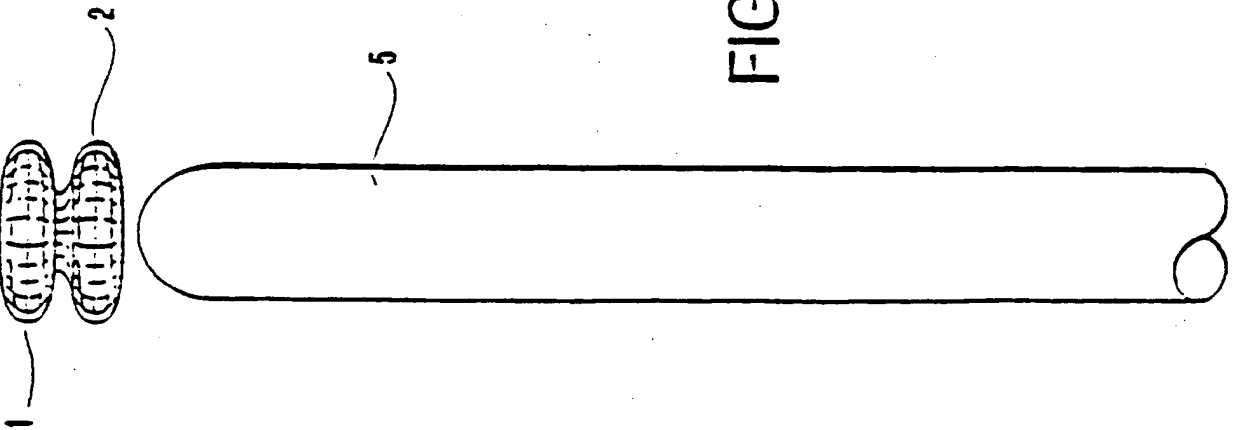


FIG 5



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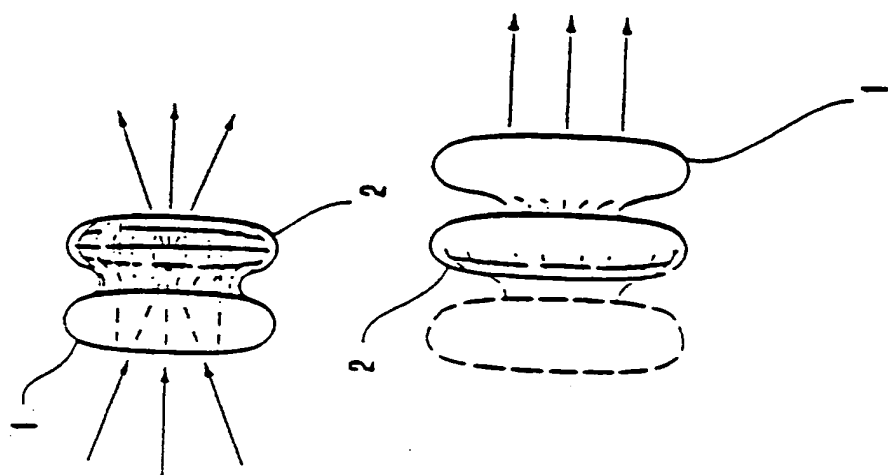


FIG 8

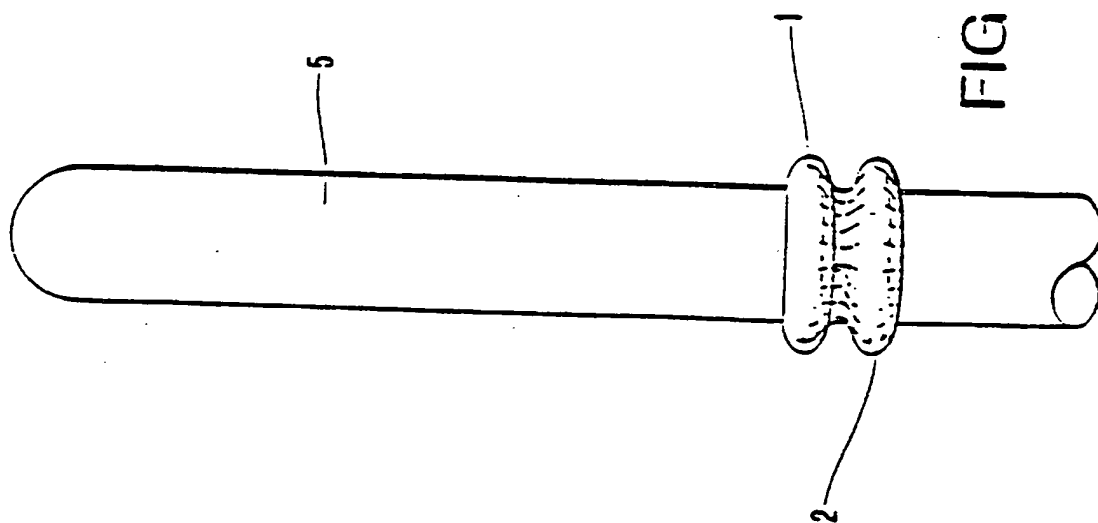


FIG 7

IMPROVED TUBULAR BANDAGES

This invention relates to tubular bandages.

Tubular bandages are in common use and are available in a range of sizes suitable for use in bandaging anything from fingers to arms, legs and toes and even the head. The bandage material is normally supplied in a roll from which a suitable length is cut for use, this length being applied to the injured part to be bandaged with the aid of an applicator. Although the use of an applicator is not particularly difficult, it does need a certain amount of time and patience and also thought to replace the applicator with the unused roll of bandage so that it is available for subsequent use. A further problem with such bandages is that a "suitable" length must be cut from the roll for use: often substantially more than is actually needed for a particular job is cut off and considerable quantities of the roll are therefore wasted.

It is also known that an improved tubular bandage is available for use, this improved tubular bandage being manufactured in such a way that it is more easily applied to an injured part. The bandage referred to and available for use is a tubular bandage comprising a length of tubular-knitted fabric comprising courses of substantially inelastic yarn interknitted with courses of elastic yarn throughout said length, the bandage having a first end portion rolled outwardly from the free end and the other end portion rolled inwardly from the opposite free end to form two rolls.

This improved tubular bandage is applied to a body part by selecting a bandage as described above of a suitable size for the part, fitting the first end portion of the

bandage around the body part, adjacent the section to be covered, unrolling the first end portion of the bandage so as to cover the body portion and subsequently unrolling the other end portion of the bandage over the first bandage portion so that the body part is in fact covered by two layers of the tubular bandage.

The provision of the improved bandages in pre-rolled form considerably facilitates their application to the injured part and avoids any need for an applicator. If the part to be bandaged comprises an extremity, such as a finger, once the first end of the bandage has been rolled into position, the centre of the bandage may be twisted, in known manner, before the other end of the bandage is rolled over the first portion so that the finger tip is fully covered. In the case of an intermediate part, such as the forearm, however, the bandage would not be twisted in this way. Although the improved tubular bandage referred to, consisting of a knitted fabric incorporating elastic and inelastic yarns, is suitable for many uses, it has now been found that the efficacy of the bandages when used for certain application is improved if certain modifications are made as improvements.

British Patent Application No. 9402817.2, of which the present application is a divisional, describes and claims a tubular bandage comprising a length of tubular knitted fabric comprising one or more courses of substantially inelastic yarn interknitted with one or more courses of elastic yarn throughout said length, the bandage having a first end portion rolled outwardly from the free end and the other end portion rolled inwardly from the opposite free end to form two rolls, the bandage further comprising a dressing attached to the said first end rolled portion of the bandage.

The present invention provides a tubular bandage comprising a length of tubular knitted fabric comprising one or more courses of substantially inelastic yarn interknitted with one or more courses of elastic yarn throughout said length, the bandage having a first end portion rolled outwardly from the free end and the other end portion rolled inwardly from the opposite free end to form two rolls, characterised in that a supporting structure is attached to said first end rolled portion of the bandage.

Embodiments of the invention and the preparation thereof will now be described by way of example with reference to the accompanying drawings, of which

Figure 1 is a side view of one embodiment of a tubular bandage in the rolled condition and attached to a supporting structure;

Figure 2 shows the supporting structure used with the embodiment of Figure 1;

Figure 3 is a side view of another embodiment of a tubular bandage in the rolled condition and attached to a supporting structure,

Figure 4 shows the supporting structure used with the embodiment of Figure 3, and

Figures 5 to 8 show a sequence of a method of rendering a finger bandage fluid-proof.

As shown in Figures 1 and 3, the invention comprises the use of one or more supporting structures attached perpendicularly to the tubular bandage at the point where the bandage is first rolled on to the body part. Any

suitable supportive material may be used, for example, thin wafers of plastics, provided that the material is sufficiently rigid or is otherwise constructed to act as a splint or support for the finger or other limb part. In the drawings, Figure 1 shows a rolled finger bandage 12 to which a pair of splints 13 are attached, for example by means of adhesive 14 applied to an end of each splint (Figure 2) for attachment inside the first roll of the bandage. Figure 3 shows the use of a splint 15 in the form of a U, the end 16 connecting the limbs thereof being secured within the first roll of the bandage by means of an adhesive 17 (Figure 4).

One or more surfaces of the material used to manufacture the tubular bandages may be treated so that the bandage when applied is resistant to the inward passage of water, oils, vapours or other fluids but optionally still allows passage outward of gases, for example air. In the practice of the invention, it is preferred to treat only one surface of the outer layer of bandage with the fluid-impervious composition and this may conveniently be carried out during the final stages of manufacture of the bandage, that is, during the rolling process. Also envisaged is a tubular bandage in which the second roll is treated to be impervious to fluids and vapours. There are various methods of rendering the bandage fluid-proof but, by way of example, one is described herein, with particular reference to the finger bandage, and is illustrated in Figures 5, 6, 7 and 8.

A tubular bandage before application of the supporting structure, suitable for example as a finger bandage, the two rolls of which are indicated as 1 and 2, is applied over a former 5. The first roll 1 of the tubular bandage is then pulled up over the former, holding the second roll 2 at the lower end of the former, as shown in Figure

6. The former over which the first roll of bandage has been unrolled is then dipped in a coating liquid, for example a liquid latex. The dip level is indicated at 6. After drying and curing as necessary, the coating is preferably treated with a material such as talc to prevent adhesion. The first roll is then rolled down again as in Figure 7 and finally both first and second rolls simultaneously are removed from the former. The roll 1 which is coated with the fluid-impervious (barrier-type) material is then pushed through the other roll 2 in the direction of the arrows illustrated in Figure 8.

Bandages according to the invention, especially when used for digits including toes, may incorporate means by which the unrolled bandage may be secured to the limb, such means including for example braid and/or thread attached to or incorporated during manufacture as part of the fabric of the bandage, or the association or attachment of some form of securing aid to the bandage, particularly to the larger bandages and to those used for veterinary purposes. This attachment may be applied in various forms; for example, it may be applied as a "pull-off" adhesive strip attached at a suitable part of the tubular bandage. Alternatively the securing aid may consist of a suitable non-irritant, non-toxic adhesive agent applied at the time of use of the bandage.

Dyestuffs may be incorporated into certain of the fibres used to manufacture the tubular bandages, thereby producing coloured tubular bandages. These are particularly useful in certain industrial applications, for example, blue finger bandages for use on personnel working in the food industry. Various dyestuffs are suitable for use in this aspect of the invention provided

they are non-toxic and non-carcinogenic. These dyestuffs carry various colours, but those which have been found to be especially suitable are red, yellow, green, black, pink and blue, partly because of their colour-fastness and partly because of their "eye-appeal" especially to children. These coloured bandages are particularly suitable for use in childrens' hospitals. Alternatively, there may be printed onto the fabric of the tubular bandages, logos, words or other identifying or illustrative means, for example by jet printing; furthermore, reflective and/or fluorescent means for arms and legs may be incorporated.

Following application of the bandage to a finger or limb, it may be dipped into a coating fluid, for example collodion. This not only has the effect of rendering the bandage substantially impervious, but it also gives a measure of support to the part. Although many different coating materials may be used, collodion has been found to be particularly useful, being a solution of pyroxylin in alcohol and ether which when applied in thin layers evaporates to leave a tough film.

In order to clarify further the various features of the present invention some explanatory technical background follows, to amplify aspects of bandages before application of the supporting structure.

The tubular bandages of the invention are provided in individual units which will normally have been cut from a longer, manufactured length of tubular material, such as stockinette. As with current bandage material, the stockinette may be knitted in a range of tube diameters for use on different parts of the body and the lengths cut for the individual bandages of the invention may be

gauged fairly accurately to cover the particular body part for which they are intended: this avoids the wastage of material which inevitably occurs when busy nurses have to judge the length required as and when it is needed. By way of example, tubular stockinette having a diameter of about 20mm and a length of approximately 200mm would be suitable for fingers while 60mm diameter tube in lengths of about 500mm would be suitable for forearms.

A bandage unit of the invention is preferably cut so that it is slightly longer than twice the length of the part to be covered so that the free ends of the bandage, when in place, are still slightly rolled: these rolls help to keep the bandage in place although plasters or other means may also be applied to ensure that the bandage is retained.

The material chosen for certain tubular bandages of the present invention comprises a knitted fabric incorporating courses of elastic yarn in addition to courses of substantially inelastic yarn. This is because the stockinette usually used for tubular bandages, which comprises plain-knitted inelastic yarn, does not roll easily and has little tendency to return to its original shape after stretching: the incorporation of the elastic yarn in the present bandages gives the fabric a certain resilience, in addition to that provided by the knitted structure, and makes it easier to roll and, once rolled, helps it remain in its rolled form.

The inelastic yarn may comprise any of the spun fibre yarns such as those currently used in bandage materials, including linen, cotton, viscose, polyester, cotton/viscose or cotton/polyester mixtures. The elastic

yarn preferably comprises a yarn of the type generally known as a bulked yarn made, for example, from continuous filaments of polyamide or which may or may not be combined with an elastomeric fibre by any method of production such as covering airtexturing; such bulked yarns provide additional advantages to that of elasticity. In particular, they transmit fluids quickly and easily, are readily washable and dry quickly so that bandages incorporating them may be washed and re-used if necessary, although they would normally be thrown away after a single use. The combination of bulk and resilience of such yarns also makes the fabric knitted from them feel softer and more comfortable in use than the stockinette currently available. In particular, the resilience enables a tubular bandage of the invention made from this fabric to contract slightly around the bandaged part, thus providing radial support and pressure which can assist healing as well as helping to keep the bandage in place, although clearly a bandage must be selected so that it is not so tight as to restrict blood circulation and cause discomfort.

The knitted fabric incorporating elastic yarn used in the bandages of the invention preferably includes alternate courses of the elastic and inelastic yarns although fabrics may have a greater or lesser proportion of the elastic yarn as convenient for a particular use. The elasticated yarn is, in effect, laid in spirals at predetermined intervals.

It may be noted that the use of two yarns in the knitted fabric constituting the bandage has the further advantage of making the fabric much less easy to unravel, and therefore less liable to fray at a cut end, than conventional stockinette.

The various aspects of the present invention relate in addition to tubular bandages in which the yarn comprises fibres containing one or more antimicrobial compounds. These fibres, as disclosed in Patent Application No. GB 9102280.6 dated 2nd February 1991, preferably comprise high performance acrylic or similar synthetic fibres either singly or as blends, containing a synergistic combination of antimicrobial compounds which ensure a wide spectrum of antimicrobial action. The active components are preferably metallic salts, for example salts of silver and zinc, each of which is known to be active in controlling the growth of bacteria and fungi. The antibacterial materials are bound within the fibre matrix to confer a high degree of activity which is not appreciably reduced by washing. This has obvious advantages over topically applied antimicrobial agents which can be readily removed in normal use and the antimicrobial performance of the fibres drastically reduced. Furthermore, acrylic fibres are resistant to microbial deterioration thereby giving more prolonged strength retention when woven into textile structures and reduced visual staining. Although the fabric would normally be plain-knitted stockinette, it could be constructed in alternative knitting stitches for specific purposes.

A metallized yarn may be incorporated in a bandage fabric for use in the present invention. Bandages made from the fabric may be detectable by metal detectors, such as those used, for example, in food-production lines to check for foreign bodies in the food produce. In this context, the metallised yarn need contain only 1%-2% by weight of metal, the fabric containing 0.5% by weight or less.

The metal incorporated in a bandage fabric, which must be sterilisable, is preferably stainless steel because of its general inertness although copper or other metals may be used when the requirements are less stringent.

CLAIMS

1. A tubular bandage comprising a length of tubular knitted fabric comprising one or more courses of substantially inelastic yarn interknitted with one or more courses of elastic yarn throughout said length, the bandage having a first end portion rolled outwardly from the free end and the other end portion rolled inwardly from the opposite free end to form two rolls, wherein a supporting structure is attached to said first end portion of said bandage.
2. A tubular bandage according to Claim 1, wherein the supporting structure comprises a wafer of plastics material to act as a splint.
3. A tubular bandage according to Claim 1 or Claim 2, wherein a pair of supporting structures are attached inside the first roll of the bandage.
4. A tubular bandage according to Claim 1, wherein the supporting structure comprises a U-shaped member in which the part bridging the limbs thereof is secured to the first roll of the bandage.
5. A tubular bandage according to any one of Claims 1 to 4, wherein the bandage further includes the association or attachment of a securing aid for securing the bandage in use.
6. A tubular bandage according to Claim 5, wherein the securing aid comprises braid, thread or an adhesive strip.
7. A tubular bandage according to any preceding claim,

wherein the knitted fabric has applied thereto a chemical agent to render the bandage resistant to the inward passage of fluids.

8. A tubular bandage according to Claim 7, wherein the chemical agent renders the bandage impervious to water.

9. A tubular bandage according to Claim 7, wherein the chemical agent renders the bandage impervious to oils.

10. A tubular bandage according to any of Claims 7 to 9 in which the chemical agent applied to the knitted fabric is applied to the second roll of the bandage.

11. A tubular bandage according to any preceding claim, wherein the bandage includes a dyestuff material.

12. A tubular bandage according to Claim 11, wherein the dyestuff comprises illustrative material.

13. A tubular bandage according to Claim 12, wherein the illustrative material is a logo.

14. A tubular bandage substantially as hereinbefore described with reference to and as illustrated in Figures 1 or 3 of the accompanying drawings.

Relevant Technical Fields

(i) UK Cl (Ed.N) A5R (RFB, RBE, RBQ, RPG)

(ii) Int Cl (Ed.6) A61F 5/04, 13/00, 13/10

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) NONE

Search Examiner
MR N A FRANKLIN

Date of completion of Search
5 DECEMBER 1995

Documents considered relevant following a search in respect of Claims :-
1-14

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&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
A	GB 2204606 A (JLB TEXTILES LIMITED)	

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